

Claims

- [c1] 1. A method for masking noise in a motor vehicle having a first automobile component having a moveable part that produces noise, the method comprising:
monitoring the speed of the vehicle; and
increasing the movement of the moveable part when the vehicle is at a predetermined speed.
- [c2] 2. The method of claim 3 wherein the step of increasing the movement of the moveable part when the vehicle is at a predetermined speed comprises:
setting the amount of movement of the moveable part to a first value when the speed of the vehicle is zero; and
monotonically increasing the amount of movement until the amount of movement as the vehicle speed increases.
- [c3] 3. The method of claim 3 wherein the step of increasing the movement of the moveable part when the vehicle is at a predetermined speed comprises:
setting the amount of movement of the moveable part to a first value when the speed of the vehicle is zero; and
linearly increasing the amount of movement of the moveable part as the speed of the vehicle increases.

- [c4] 4. The method of claim 1 wherein the first automobile component is a fan.
- [c5] 5. The method of claim 4 wherein the fan cools a second automobile component.
- [c6] 6. The method of claim 5 wherein the second automobile component is a battery or a radiator.
- [c7] 7. The method of claim 6 further comprising:
 - monitoring the temperature of the second automobile component; and
 - increasing the movement of the fan when the temperature reaches a predefined value irrespective of the vehicle speed.
- [c8] 8. The method of claim 7 wherein the step of increasing the movement of the moveable part when the temperature reaches a predefined value comprises:
 - setting the duty cycle of the fan to a first duty cycle value when the temperature of the second automobile component is equal to or below a first temperature value; and
 - monotonically increasing the duty cycle as the temperature of the second component increases until the duty cycle reaches a second duty cycle value.
- [c9] 9. The method of claim 7 wherein the step of increasing the movement of the moveable part when the vehicle is

at a predetermine speed comprises:
setting the duty cycle of the fan to a first duty cycle value
when the temperature of the second automobile compo-
nent is equal to or below a first temperature value; and
linearly increasing the duty cycle as the temperature of
the second component increases until the duty cycle
reaches a second duty cycle value.

- [c10] 10. The method of claim 1 wherein the motor vehicle is a hybrid electric vehicle, a fuel cell vehicle, or a vehicle with an internal combustion engine.
- [c11] 11. The method of claim 1 wherein the motor vehicle is a hybrid electric vehicle.
- [c12] 12. A method for masking noise in a hybrid electric vehicle having a fan to cool a battery, the method comprising:
monitoring the speed of the vehicle; and
increasing the movement of the fan when the vehicle is greater than or equal to a predetermined speed.
- [c13] 13. The method of claim 12 wherein the step of increasing the movement of the fan when the vehicle is at a predetermined speed comprises:
setting the duty cycle of the fan to a first duty cycle value when the speed of the vehicle is zero; and

monotonically increasing the duty cycle as the speed of the vehicle increases until the duty cycle reaches a second duty cycle value.

- [c14] 14. The method of claim 12 wherein the step of increasing the movement of the fan when the vehicle is at a predetermined speed comprises:
 - setting the duty cycle of the fan to a first duty cycle value when the speed of the vehicle is zero; and
 - linearly increasing the duty cycle as the speed of the vehicle increases until the duty cycle reaches a second duty cycle value.
- [c15] 15. The method of claim 12 further comprising:
 - monitoring the temperature of the second automobile component; and
 - increasing the movement of the fan when the temperature reaches a predefined value irrespective of the vehicle speed.
- [c16] 16. The method of claim 15 wherein the step of increasing the movement of the fan when the temperature reaches a predefined value comprises:
 - setting the duty cycle of the fan to a first duty cycle value when the temperature of the second automobile component is equal to or below a first temperature value; and
 - monotonically increasing the duty cycle as the tempera-

ture of the second component increases until the duty cycle reaches a second duty cycle value.

- [c17] 17. The method of claim 15 wherein the step of increasing the movement of the fan when the vehicle is at a predetermine speed comprises:
setting the duty cycle of the fan to a first duty cycle value when the temperature of the second automobile component is equal to or below a first temperature value; and
linearly increasing the duty cycle as the temperature of the second component increases until the duty cycle reaches a second duty cycle value.
- [c18] 18. The method of claim 17 wherein the first temperature value is from about 25°C to about 40°C, first duty cycle value is from about 30% to about 100%, and the second duty cycle value is from 70% to 100%.
- [c19] 19. A system for masking noise in a hybrid electric vehicle, the system comprising:
a battery;
a fan to cool the battery;
a vehicle speed monitor;
a fan controller that receives a control signal from the vehicle speed monitor wherein the fan controller increases the duty cycle of the fan when the vehicle is at a predetermined speed.

- [c20] 20. The system of claim 19 wherein the fan controller sets the duty cycle of the fan to a first duty cycle value when the speed of the vehicle is zero and monotonically increases the duty cycle as the speed of the vehicle increases until the duty cycle reaches a second duty cycle value.
- [c21] 21. The system of claim 19 further comprising a temperature monitor that determines the temperature of the battery and sends a control signal to the fan controller wherein the fan controller increases the duty cycle of the fan when the temperature reaches a predefined value irrespective of the vehicle speed.
- [c22] 22. The system of claim 21 wherein the fan controller sets the duty cycle of the fan to a first duty cycle value when the temperature of the battery is equal to or below a first temperature value and monotonically increases the duty cycle as the temperature of the second component increases until the duty cycle reaches a second duty cycle value.